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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service

SEASONAL ADJUSTMENT OF DATA RELATING TO MANUFACTURED TOBACCO PRODUCTS AND LEAF EXPORTS

by

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It has long been recognized that economic data subject to seasonal influences must be adjusted to eliminate such effects before month-to-month or other short-term changes may be studied. 1/ Data relating to tobacco products and leaf exports are no exception. Before we know whether a statistic for a particular month or quarter is rising or falling in relation to the preceding comparable period, we must adjust both for the seasonal influences which normally may make one month or one quarter higher or lower than the monthly or quarterly average for the year. Generally speaking, however, satisfactory seasonal adjustments frequently have been difficult to make because of (1) the burden of computations involved, and (2) the inadequacy of commonly used techniques to isolate and completely remove fluctuations solely attributable to seasonal factors.

The advent of electronic computers has largely eliminated the first limitation, and the application of refined statistical techniques made possible by electronic computers may help to overcome the second. Such a refined method of seasonal adjustment, first developed at the U. S. Bureau of the Census and improved and extended at the National Bureau of Economic Research, has been used to adjust certain data on manufactured tobacco products and flue-cured exports. These data underlie the series of charts shown for the first time in the July 1958 issue of the Tobacco Situation. The charts will be carried as a regular feature of the Situation. The present publication provides a short description of the methodology used to make the seasonal adjustments, and includes tables showing the seasonally adjusted data on which the charts are based.

1/ Discussions of seasonal variation and commonly used techniques to eliminate such variation may be found in most standard textbooks on statistics. See, for example, Mills (3, pp. 360-375), Croxton and Cowden (1, pp. 320-363), Wallis and Roberts (6, pp. 580-586). Underlined numbers in parentheses refer to Literature Cited, page 7.

Seasonal Adjustment by Conventional Method and Census Method 2/

Any economic time series is a composite of cyclical, trend, seasonal, and irregular factors. The object of seasonal adjustment, of course, is to eliminate, as much as possible, the seasonal factors--those which recur uniformly from year to year. The conventional method, that of the ratio-to-moving average, is described in most standard textbooks on statistics. Briefly, the usual steps are as follows:

(1) A 12-month moving average of the original data is computed. This provides a measure of the cycle-trend component, since the seasonal-irregular components (which occur within the year) are presumed to be largely eliminated by the averaging process.

(2) The 12-month moving average is centered.

(3) Each observation in the original series (except the first six and last six) is divided by the matching centered 12-month moving average. The resulting "ratios" are presumed to contain primarily seasonal and irregular factors.

(4) These "ratios to 12-month moving average" are averaged, month by month, after omitting extreme values. Plotting the ratios on a separate chart for each month helps to identify extreme ratios, as well as to determine whether the seasonal pattern in changing over time. 3/ The averaging process is intended to eliminate the irregular factors, leaving only the seasonal factor.

(5) The 12 monthly means are adjusted to add to 1,200. The resulting factors are stable seasonal adjustment factors, obtained by the conventional manual method.

(6) The original observations are divided by the appropriate monthly seasonal factors, to arrive at a seasonal adjusted series.

The Census method is basically a highly refined mechanical version of this ratio-to-moving average method. It consists of two "rounds" of computations, the first round of which is similar to the conventional method except for some computations to identify and replace extreme ratios. Whereas the manual method stops at this point, the Census method goes on to a second round of computations, the purpose of which essentially is (1) to get a better measure of the cycle-trend component than the 12-month moving average of the original data, and (2) to obtain better smoothing by utilizing different moving averages. The detailed computations

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2/ No attempt is made here to describe fully the Census method of seasonal adjustment, but merely to indicate some of its features that distinguish it from the conventional method. For a fuller description, the reader is referred to Shiskin (4) and Shiskin and Eisenpress (5).

3/ If the latter is found, a trend--either linear or curvilinear, as is required--is fitted, and moving seasonal factors, i.e., a different factor for each month in the series, are computed. See, for example, Foote and Fox (2, pp. 4, 6-7).

of this iterative procedure are feasible, of course, when electronic computers are used, as they remove the burden of computations. The method is complex--more than 40 separate steps are involved in the computations to arrive at (1) seasonal adjustment factors, (2) seasonally adjusted series, (3) measures of the irregular, cycle-trend, and seasonal components, and (4) tests of the work. Five different types of moving averages are used, three of which are weighted moving averages. The method yields more than 25 tables.

The Census method is considered to yield results that compare favorably with the best manual methods (5, pp. 416, 431), at a fraction of the usual time and cost. It has the added advantage of providing considerable information not furnished by the customary methods.

Seasonal Adjustment Factors For Manufactured Tobacco Products and Flue-Cured Exports

Table 1, page 8, shows the stable seasonal adjustment factors developed by the electronic computer program for the following series:

(1) Cigarette production.
(2) Cigarette tax-paid removals.
(3) Cigar production (large cigars produced in domestic factories).
(4) Smoking tobacco production.
(5) Scrap chewing tobacco production.
(6) Chewing tobacco (other than scrap) production. Included are plug, twist, and fine-cut.
(7) Snuff production.
(8) Flue-cured tobacco exports.

The factors are based on data for 1948-57, and have been rounded to the nearest whole percentage from data computed to one decimal place. The period 1948-57 may be open to some question as representing a "normal" period on which to base seasonality because of the Korean War and also the operation of Governmental programs affecting exports. These years, however, represent the only ones sufficiently removed from the more serious dislocations prevailing during World War II and the immediate postwar period. When additional data become available for a sufficient number of years, the seasonal analysis should be rerun.

As monthly cigar production in domestic factories was first reported by the Internal Revenue Service in 1949, monthly production data for 1948 were estimated from reported tax-paid withdrawals to complete the 10-year series.

Seasonal factors for large cigars manufactured in customs-bonded warehouses have also been calculated, but they are not shown in table 1 because of the short series on which they are based. These factors were developed manually by the ratio-to moving average method, which seemingly yielded better results than some other methods that were tried. It is recognized that basing seasonals on a short series leaves much to be desired. But graphic inspection gave evidence of seasonality in the data, and adjustment was necessary before the figures could be combined with cigar output in domestic factories to give total cigar production on a

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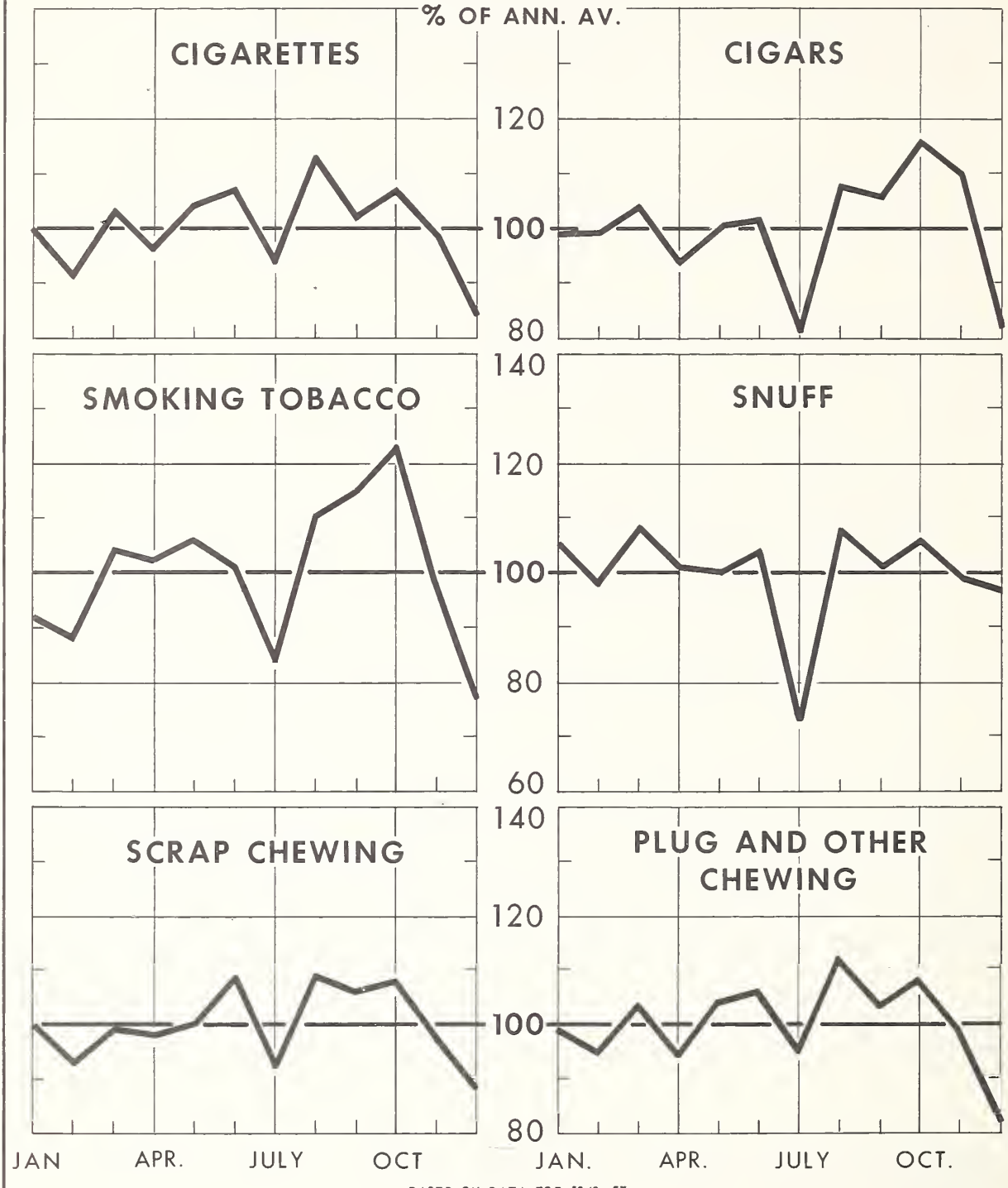

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seasonally adjusted basis. As cigars manufactured in bonded warehouses comprise only a small percentage of all large cigars produced domestically--around 4 percent in 1957--their inclusion does not appreciably affect the overall seasonally adjusted series on cigar production.

Tables 2-11 show the above series adjusted for seasonal variation by use of the stable seasonal factors shown in table 1. Monthly data for the period 1948 to date are shown for all series except total cigar production and total leaf exports, for which quarterly data are shown for 1956 to date. The electronic computer program automatically furnishes seasonally adjusted data for the full period considered. They are shown here because of their possible interest to readers concerned with years prior to 1956. The monthly data for 1956 to date can easily be combined into quarterly totals and then multiplied by 4 to match the plotted points in the June 1958 Tobacco Situation charts (which are at annual rates). Seasonally adjusted data shown in tables 2-11 were computed by use of unrounded factors.

Seasonals were also run by the electronic computer program for exports of tobacco other than flue-cured, by separate types, using data for 1948-57, but results did not show evidence of seasonality. Tobacco types considered were burley, Maryland, Virginia fire-cured, and Kentucky-Tennessee fire-cured. For purposes of charting total leaf tobacco exports, those of flue-cured (on a seasonally adjusted basis, converted to farm-sales weight) are added to reported exports of tobacco other than flue-cured (converted to farm sales weight). Flue-cured, of course, is the predominant export type, usually comprising around four-fifths of total U. S. tobacco exports.

Further Adjustments in Flue-Cured Exports

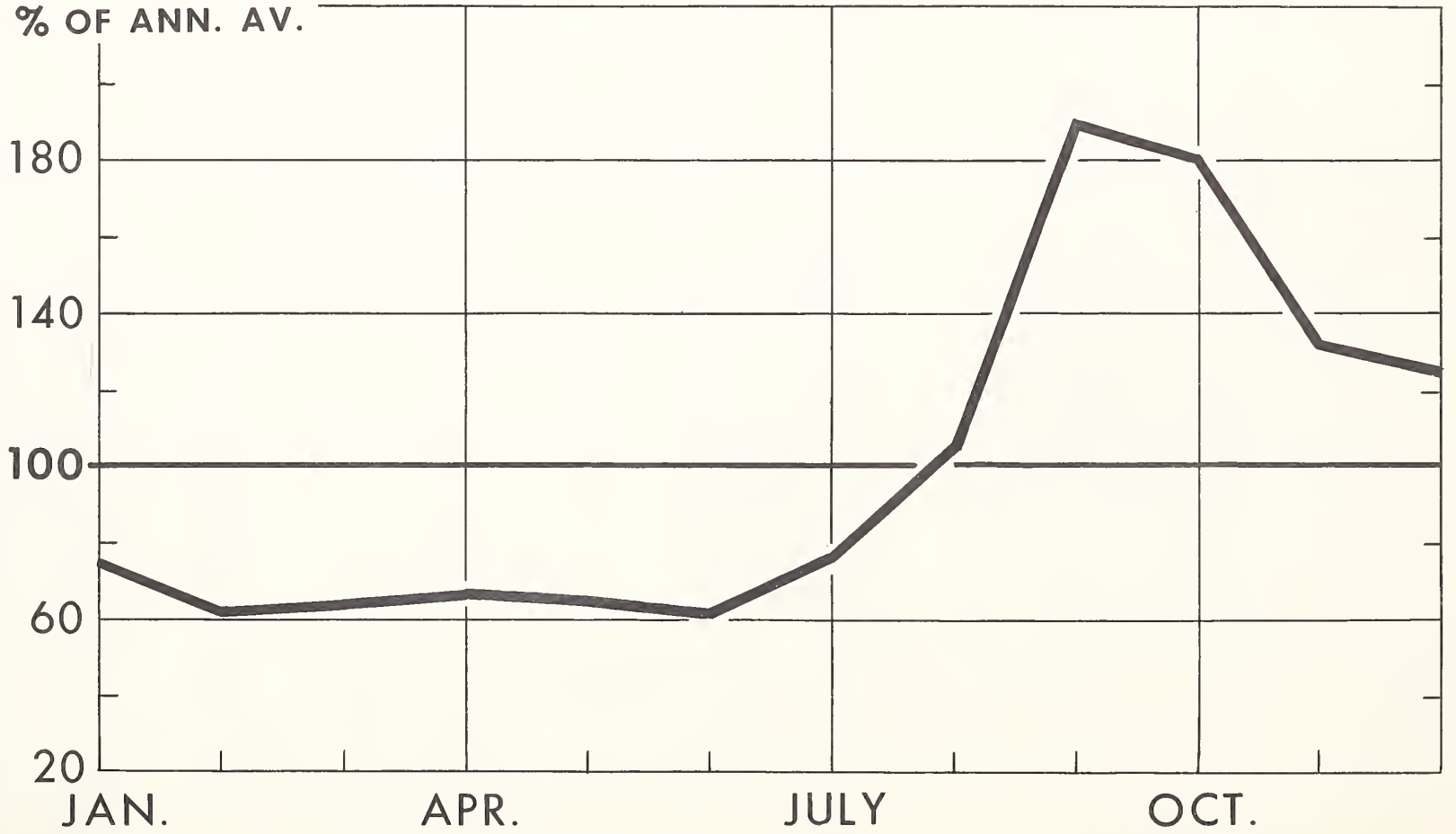
Adequate seasonal indexes for exports are more difficult to develop than for most other series. This is because of (1) the strong irregular or random factors that usually affect month-to-month changes and (2) the varying amplitude of the seasonal swings. Flue-cured exports, for example, tend to show the same general seasonal pattern from year to year, but the seasonal movements may vary in amplitude. For this reason, further adjustments are sometimes necessary to avoid overcorrection or undercorrection by use of the stable seasonal factors. Such adjustments (similar in nature to that described by Croxton and Cowden, 1, pp. 360-361) were made for flue-cured exports for certain years shown in table 9.

Stable Versus Moving Seasonal Indexes 4/

When there is a gradual change in seasonality, moving seasonal indexes--those which allow for shifts over time--are more appropriate than stable indexes. Moving seasonals however, do not appear to be required in the case of the series considered here as there is no clear-cut graphic evidence of changing seasonality. Certain statistical measures furnished by the electronic computer program confirm the judgement that stable indexes are more appropriate. These measures include (1) the total variability of a series as measured by the average month-to-month percentage change (signs disregarded), referred to as "average amplitude", and (2) the

4/ For a discussion of moving seasonals, see Croxton and Cowden (1, pp. 340-363).

SEASONALITY IN FLUE-CURED TOBACCO EXPORTS



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decomposition of this total variability into its components--attributable to (a) seasonal factors (b) irregular factors, and (c) cycle-trend. When the average month-to-month amplitude of the irregular factors is 4 percent or more, stable seasonal factors are considered more appropriate than moving seasonals (5, p. 434).

Table 12 shows the average amplitudes for the original series, and their components. Also shown are certain ratios of these measures which enable quick determination of the relative importance of seasonal and irregular factors. Ratios involving the cycle-trend component are not shown, as this component is of little importance in the total variability of the series considered. 5/ Two things should be stressed at this point: (1) these measures of average amplitude are not additive to the total, and (2) levels of statistical significance for the measures and their ratios are not presently available, so that interpretation of absolute values and their differences rest on judgment.

Inspection of table 12 indicates that the seasonal component is the most influential component in the case of the series on production, cigarette tax-paid removals, and flue-cured exports. In the case of exports of other tobacco types, however, the effect of the irregular factors far outweighs that of seasonal factors. Even in the series where the seasonal factors predominate, the average amplitude of the irregular factors is greater than 4 percent, supporting the applicability of stable seasonals.

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5/ The Census method regards the trend factor as ordinarily having little effect on month-to-month movements of economic series, and combines it with the cyclical factor.

Table 1.--Manufactured tobacco products and flue-cured exports: Seasonal adjustment factors 1/

Item	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Production:												
Cigarettes	100	91	103	96	104	107	94	113	102	107	99	84
Cigars 2/	99	99	104	94	100	101	81	108	106	116	110	82
Smoking tobacco	92	88	104	102	106	101	84	110	115	123	98	77
Chewing tobacco												
Scrap	100	93	99	93	100	109	92	109	106	108	93	88
Plug and other	99	95	103	94	104	106	95	112	103	108	99	82
Snuff	105	98	108	101	100	104	73	108	101	106	99	97
Cigarette tax-paid removals	100	91	102	95	105	107	94	114	102	107	98	85
Flue-cured exports	75	62	64	66	65	61	76	105	189	180	132	125

1/ Percentage ratio of each month to the annual average as 100. Based on data for 1948-57.
2/ Large (weighing more than 3 pounds per 1,000), produced in domestic factories.

Table 2.--Cigarettes: Production adjusted for normal seasonal variation, 1948-58

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.
1948	30.55	29.85	31.30	35.52	30.06	32.35	32.38	33.35	33.35	32.70	32.58	32.72
1949	30.45	30.34	33.82	31.91	32.59	33.75	29.70	33.91	33.67	29.90	32.68	31.52
1950	31.44	30.63	33.09	29.11	33.56	33.27	32.20	38.17	33.02	30.73	33.26	32.37
1951	36.23	35.03	32.58	34.26	35.19	33.62	34.27	35.30	32.81	38.32	38.64	31.99
1952	37.52	35.48	32.07	36.06	34.68	34.46	39.18	35.49	38.80	39.05	34.11	39.35
1953	34.78	38.21	36.93	35.58	31.95	34.07	35.37	33.23	36.06	35.52	34.38	38.11
1954	31.98	32.16	37.30	34.48	32.84	35.54	33.71	32.50	34.91	31.83	33.39	34.21
1955	34.04	33.38	35.17	32.46	35.31	36.34	32.53	34.62	34.11	33.49	35.34	34.88
1956	35.84	36.00	34.05	33.80	37.28	34.88	35.59	35.65	32.75	37.33	37.15	33.51
1957	39.18	38.01	34.19	36.29	39.00	35.05	40.83	35.77	36.73	38.31	34.55	34.51
1958	39.43	37.11	34.85	39.78	38.68	38.45						

Table 3.--Cigarettes: Tax-paid removals adjusted for normal seasonal variation, 1948-58

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.	Bil.
1948	27.22	25.76	28.56	33.42	27.70	29.22	28.94	29.96	29.57	29.02	29.55	29.43
1949	27.91	27.46	30.71	28.87	29.23	30.70	27.46	30.98	31.30	27.25	30.14	29.29
1950	29.23	28.14	31.29	27.30	31.11	30.67	29.12	34.29	30.42	27.77	30.32	29.55
1951	33.40	31.68	29.45	31.21	31.22	30.35	31.64	32.08	30.37	35.00	34.54	28.19
1952	33.06	32.17	29.18	33.58	31.35	32.25	36.00	31.52	34.47	34.89	30.88	35.54
1953	32.44	35.36	33.30	33.41	29.13	31.12	31.82	30.38	33.14	32.55	30.83	34.44
1954	28.80	29.29	31.54	32.24	30.34	32.71	30.81	30.30	31.52	29.50	30.18	31.50
1955	30.38	31.45	32.91	30.43	32.86	33.32	30.38	32.22	31.64	30.76	33.17	32.34
1956	32.80	33.73	31.71	31.90	34.44	32.06	33.01	32.92	29.98	34.72	34.13	31.50
1957	35.91	34.79	32.44	33.89	36.33	31.95	37.50	33.31	34.20	35.71	32.06	31.22
1958	35.77	34.43	32.20	37.71	35.85	36.11						

Table 4.--Cigars: Production adjusted for normal seasonal variation, 1948-58 1/

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.
1948	453.7	452.9	475.5	447.7	455.8	435.4	461.3	486.8	511.1	448.5	510.3	505.7
1949	468.3	436.2	453.3	417.7	429.5	463.8	441.4	486.6	492.0	441.6	461.1	435.5
1950	444.2	476.2	447.3	403.8	438.2	455.7	426.6	429.9	453.3	474.4	469.5	434.5
1951	491.3	478.5	474.1	434.7	455.1	451.5	456.7	465.7	428.5	486.2	469.9	441.9
1952	503.8	485.9	472.0	510.6	495.9	465.4	531.1	443.4	432.5	500.0	443.0	514.1
1953	480.9	527.4	489.2	525.8	498.6	497.6	533.1	456.5	482.5	484.1	465.7	528.5
1954	472.0	480.1	500.2	492.2	464.4	511.0	482.9	486.9	496.2	468.6	481.1	484.4
1955	446.2	462.5	499.5	469.4	489.5	519.4	451.1	496.9	489.7	455.4	485.3	496.4
1956	490.1	495.9	468.4	498.5	502.7	477.3	475.4	497.6	434.7	491.5	481.7	450.2
1957	500.3	484.9	475.4	509.9	505.8	468.6	489.9	499.6	485.8	512.7	475.0	489.2
1958	523.3	480.5	468.4	516.5	510.5	501.4						

1/ Cigars weighing over 3 pounds per 1,000, produced in domestic factories.

Table 5.--Smoking tobacco: Production adjusted for normal seasonal variation, 1948-58

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1948	8.67	8.85	8.58	9.53	8.52	9.18	9.01	8.50	9.24	9.54	8.94	8.87
1949	7.99	8.58	9.21	8.39	9.57	9.67	8.72	9.33	9.16	8.94	9.29	9.05
1950	9.17	9.00	9.82	8.25	8.69	9.26	8.25	9.29	9.18	9.68	9.12	7.31
1951	9.20	8.85	8.45	8.58	8.61	8.83	8.14	8.81	8.37	6.52	9.48	7.82
1952	9.32	8.90	7.44	7.72	8.00	7.93	8.63	7.57	8.15	7.94	7.02	8.65
1953	7.45	7.55	7.18	7.93	7.09	7.37	7.52	6.85	7.19	6.84	6.47	6.97
1954	6.00	6.91	7.60	7.24	6.65	6.89	7.11	6.89	7.24	6.67	7.11	7.48
1955	7.05	7.25	7.36	6.72	7.23	7.08	6.24	6.35	6.10	5.90	6.46	6.17
1956	6.16	6.25	6.26	6.47	6.28	5.38	5.69	6.07	5.36	5.85	6.12	5.52
1957	6.52	5.52	5.20	5.66	5.76	5.63	6.56	6.14	5.68	6.10	5.81	5.97
1958	6.52	6.35	6.34	6.75	6.54	6.32						

Table 6.--Scrap chewing tobacco: Production adjusted for normal seasonal variation, 1948-58

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1948	3.36	3.44	3.59	3.46	3.28	3.43	3.38	3.63	3.56	3.63	3.85	3.75
1949	3.39	3.35	3.17	2.99	2.83	3.50	3.21	3.76	3.55	3.25	3.14	3.49
1950	3.33	3.52	3.66	2.90	2.38	3.32	3.36	3.91	3.34	3.20	2.98	3.04
1951	3.43	3.38	3.36	3.11	3.34	3.19	3.22	3.48	3.10	3.03	3.43	3.01
1952	3.41	3.52	3.11	3.22	3.33	3.11	3.16	2.77	3.12	3.31	2.97	3.39
1953	2.75	3.10	3.30	3.35	3.26	3.10	3.47	2.71	3.28	3.20	3.13	3.27
1954	3.03	3.07	3.03	3.24	3.15	3.04	3.04	2.77	2.94	2.94	3.23	3.15
1955	2.92	2.88	3.28	3.13	3.08	3.20	2.80	2.83	3.05	2.99	3.05	2.95
1956	3.02	3.01	2.91	3.19	3.23	3.01	2.94	2.87	2.75	2.95	2.91	2.54
1957	2.98	2.63	2.70	3.06	3.24	2.67	2.92	2.78	2.72	2.86	2.65	2.75
1958	2.80	2.74	2.61	2.86	2.96	2.71						

Table 7.--Chewing tobacco, other than scrap: Production adjusted for normal seasonal variation, 1948-58 1/

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1948	4.38	4.54	4.58	5.19	3.92	4.20	4.47	4.40	4.75	4.53	4.65	4.69
1949	3.84	3.87	4.36	4.27	4.23	4.50	4.14	4.24	4.44	3.96	4.03	4.36
1950	4.26	3.96	4.34	3.74	4.03	4.03	3.91	4.11	3.96	4.11	3.98	3.93
1951	4.18	4.15	3.89	3.87	4.05	3.80	3.91	3.97	3.65	3.57	4.53	3.77
1952	4.12	4.20	3.52	4.00	3.86	3.73	4.10	3.57	3.94	4.06	3.48	4.25
1953	3.66	3.97	3.76	3.89	3.85	3.76	4.18	3.50	3.66	3.73	3.77	3.78
1954	3.78	3.74	3.75	3.78	3.63	3.91	3.77	3.74	3.86	3.57	3.72	3.55
1955	3.64	3.53	3.90	3.62	3.67	3.67	3.02	3.71	3.61	3.39	3.66	3.35
1956	3.49	3.64	3.38	3.26	3.37	3.32	2.98	3.48	3.01	3.51	3.50	3.21
1957	3.68	3.25	3.17	3.26	3.17	2.77	3.30	3.18	3.14	3.34	2.92	3.07
1958	3.29	2.81	2.68	3.20	3.06	2.95						

1/ Comprises plug, twist, and fine-cut chewing tobacco.

Table 8.--Snuff: Production adjusted for normal seasonal variation, 1948-58

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1948	3.33	3.33	3.59	3.37	3.19	3.36	4.04	3.07	3.45	3.26	3.38	3.63
1949	3.28	3.33	3.42	3.23	3.26	3.29	3.28	3.53	3.62	3.46	3.59	3.61
1950	2.80	2.99	3.47	3.33	3.41	3.61	3.87	3.62	3.18	3.42	3.32	3.09
1951	3.54	3.36	3.29	3.28	3.51	3.07	3.08	3.39	3.04	2.98	3.57	3.29
1952	3.58	3.54	3.22	3.28	3.12	3.00	3.09	2.92	3.26	3.43	2.93	3.33
1953	3.25	3.18	3.10	3.31	3.08	3.24	3.42	3.10	3.26	3.20	3.09	3.48
1954	3.02	3.16	3.43	3.27	3.32	3.34	2.98	3.27	3.38	2.86	3.22	3.19
1955	3.06	3.38	3.43	3.33	3.36	3.45	2.82	3.39	3.35	3.08	3.28	3.19
1956	3.20	3.36	2.94	3.24	3.38	3.11	2.91	3.24	2.86	3.43	3.08	2.52
1957	3.20	2.96	2.78	3.09	3.17	3.15	3.09	2.95	2.96	3.13	2.82	2.93
1958	2.96	2.91	2.50	2.81	3.05	2.78						

Table 9.--Flue-cured tobacco: Exports adjusted for seasonal variation, 1948-58

(declared weight)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1948 1/	26.5	35.9	28.7	34.1	36.2	27.4	45.4	32.2	22.6	19.3	15.6	31.2
1949	47.8	42.8	24.0	20.1	11.9	26.8	26.8	45.9	37.2	28.5	24.1	34.5
1950	16.5	24.7	30.5	52.7	45.4	20.1	22.2	36.6	33.2	33.6	33.9	29.6
1951	34.0	25.8	33.8	32.3	23.9	27.7	26.5	40.6	35.5	44.7	40.7	42.4
1952 1/	37.0	38.5	30.4	22.4	33.3	30.6	26.5	26.8	22.5	20.9	25.3	23.9
1953 1/	31.8	31.3	59.2	55.2	47.1	40.2	28.7	27.7	33.0	30.0	35.9	42.8
1954 1/	35.3	23.8	26.3	28.5	31.7	29.6	26.6	23.1	25.7	40.5	37.0	29.4
1955	33.2	34.4	37.6	18.7	27.8	33.0	57.2	39.0	42.0	43.8	40.9	30.9
1956 1/	43.2	36.3	35.3	36.7	39.9	39.3	26.6	30.2	35.6	34.0	31.1	35.4
1957	32.4	33.0	39.6	33.4	37.8	49.6	32.9	32.4	35.9	37.6	29.7	29.6
1958	23.8	25.2	40.5	26.0	26.9	41.7						

1/ Corrected for amplitude. See page 5.

Table 10.--Cigars: Total production by quarters, seasonally adjusted at annual rates, 1956-58 1/

Quarter	1956	1957	1958
	Millions	Millions	Millions
January-March	6,054	6,082	6,117
April-June	6,147	6,174	6,370
July-September	5,854	6,150	
October-December	5,928	6,152	

1/ Cigars weighing more than 3 pounds per 1,000, produced in domestic factories and customs bonded warehouses.

Table 11.--Tobacco exports, by quarters, seasonally adjusted at annual rates, 1956-58

(farm-sales weight)

Year and quarter	Flue-cured 1/	Total 2/	Year and quarter	Flue-cured 1/	Total 2/	Year and quarter	Flue-cured 1/	Total 2/
	Million pounds	Million pounds		Million pounds	Million pounds		Million pounds	Million pounds
1956			1957			1958		
Jan.-Mar.	518	609	Jan.-Mar.	474	548	Jan.-Mar.	411	508
Apr.-June	522	612	Apr.-June	547	640	Apr.-June	426	507
July-Sept.	415	505	July-Sept.	460	540	July-Sept.		
Oct.-Dec.	452	556	Oct.-Dec.	437	519	Oct.-Dec.		

1/ Adjusted for seasonal variation.
2/ Total leaf exports. Includes flue-cured adjusted for seasonal variation.

Table 12.--Manufactured tobacco products and exports: Average monthly amplitudes of specified series and their components, 1948-57

Series	Average amplitude 1/				Ratios of average amplitude 2/		
	Original series	Components			Seasonal / Original	Irregular / Original	Irregular / Seasonal
		Seasonal	Irregular	Cycle-trend			
	Percent	Percent	Percent	Percent			
Production:							
Cigarettes	12.2	10.9	5.7	.6	.89	.47	.53
Cigars	12.6	11.6	4.7	.6	.92	.37	.41
Smoking tobacco	14.5	13.0	6.5	.9	.90	.45	.50
Chewing tobacco							
Scrap	10.6	8.7	5.5	.6	.83	.52	.63
Plug and other	11.2	9.9	6.1	.7	.89	.55	.62
Snuff	13.6	11.6	6.0	.8	.85	.45	.52
Cigarette tax-paid removals	12.3	11.2	5.5	.6	.91	.45	.49
Exports:							
Flue-cured	39.0	25.0	23.3	5.2	.64	.60	.93
Burley	58.9	26.8	46.4	7.3	.45	.79	1.73
Maryland	80.1	34.1	65.0	7.6	.43	.81	1.90
Virginia fire-cured	92.0	48.7	65.3	7.9	.53	.71	1.34
Kentucky-Tennessee fire-cured	56.2	28.4	38.6	7.2	.50	.69	1.36

1/ Average month-to-month percentage change, disregarding signs. Components are not additive to the total. See page 7.
2/ Computed from unrounded figures.